

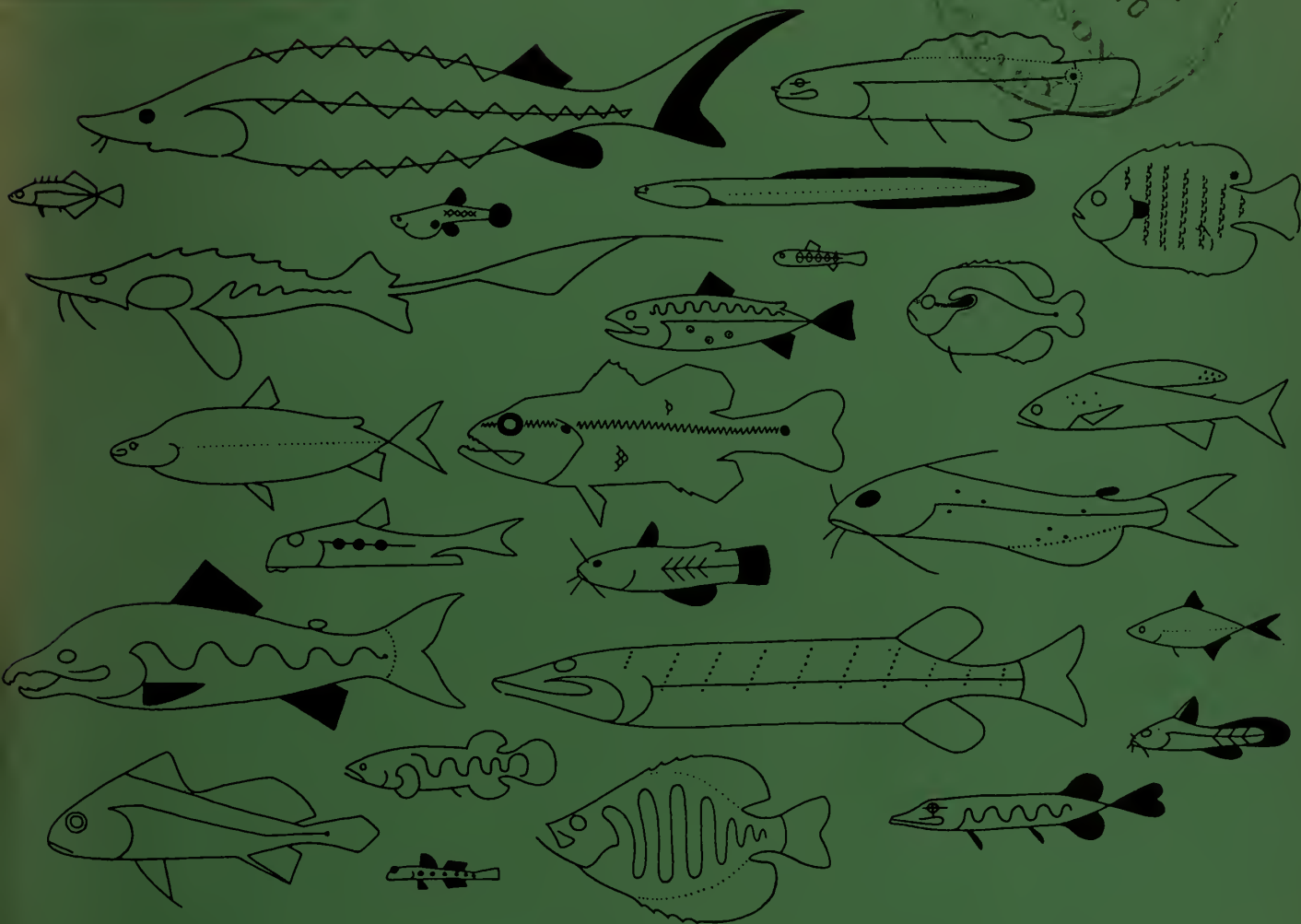
DIVISION OF FISHERY SERVICES

ANNUAL REPORT FOR 1969

Clemson University



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UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE

RESOURCE PUBLICATION 89

As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of this department of natural resources.

The Department works to assure the wisest choice in managing all our resources so that each shall make its full contribution to a better United States now and in the future.

Cover -- Drawing by Craig Phillips, National Fisheries Center and Aquarium, Washington, D.C.

UNITED STATES DEPARTMENT OF THE INTERIOR, WALTER J. HICKEL, *SECRETARY*
Leslie L. Glasgow, *Assistant Secretary for Fish and Wildlife and Parks*
Fish and Wildlife Service, Charles H. Meacham, *Commissioner*
Bureau of Sport Fisheries and Wildlife, John S. Gottschalk, *Director*

DIVISION OF FISHERY SERVICES

ANNUAL REPORT

1969

Willis King, Chief



Prepared by R. T. Webb and F. R. Richardson

Bureau of Sport Fisheries and Wildlife
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LOCATIONS OF REGIONAL OFFICES, DIVISION FIELD STATIONS AND COOPERATIVE FISHERY UNITS

Legend:

- REGIONAL OFFICE
- DIVISION FIELD STATION
- ★ COOPERATIVE FISHERY UNIT

Region 1 (West): Seattle, Tumwater, Portland, Corvallis, Arcata, Reno, Parker, Tucson, Mescalero, Gallup, Pinetop, Albuquerque, Vernal, Fort Collins, Lander, Yellowstone, Bozeman, Kalispell, Moscow, Bismarck, N. Dak., S. Dak., Valentine, Stillwater, Oka, Kans., Ark., Miss., La. Rouge, Auburn, Athens, Atlanta, Ga., Raleigh, Blacksburg, Cherokee, Pisgah Forest, Gatlinburg, Maryville, Tenn., Ky., W. Va., Va., Blacksburg, Washington, D.C., University, Baltimore, Md., Trenton, N.J., New Windsor, N.Y., Amherst, Mass., Springfield, Mass., Montpelier, Vt., New Hampshire, Oregon, Washington, D.C.

Region 2 (Central): Minneapolis, Ames, Davenport, Columbia, Ill., Printon, Ind., Wisc., Minn., N. Dak., S. Dak., Valentine, Kans., Ark., Miss., La. Rouge, Auburn, Athens, Atlanta, Ga., Raleigh, Blacksburg, Cherokee, Pisgah Forest, Gatlinburg, Maryville, Tenn., Ky., W. Va., Va., Blacksburg, Washington, D.C., University, Baltimore, Md., Trenton, N.J., New Windsor, N.Y., Amherst, Mass., Springfield, Mass., Montpelier, Vt., New Hampshire, Oregon, Washington, D.C.

Region 3 (East): Minneapolis, Ames, Davenport, Columbia, Ill., Printon, Ind., Wisc., Minn., N. Dak., S. Dak., Valentine, Kans., Ark., Miss., La. Rouge, Auburn, Athens, Atlanta, Ga., Raleigh, Blacksburg, Cherokee, Pisgah Forest, Gatlinburg, Maryville, Tenn., Ky., W. Va., Va., Blacksburg, Washington, D.C., University, Baltimore, Md., Trenton, N.J., New Windsor, N.Y., Amherst, Mass., Springfield, Mass., Montpelier, Vt., New Hampshire, Oregon, Washington, D.C.

Hawaii: Honolulu

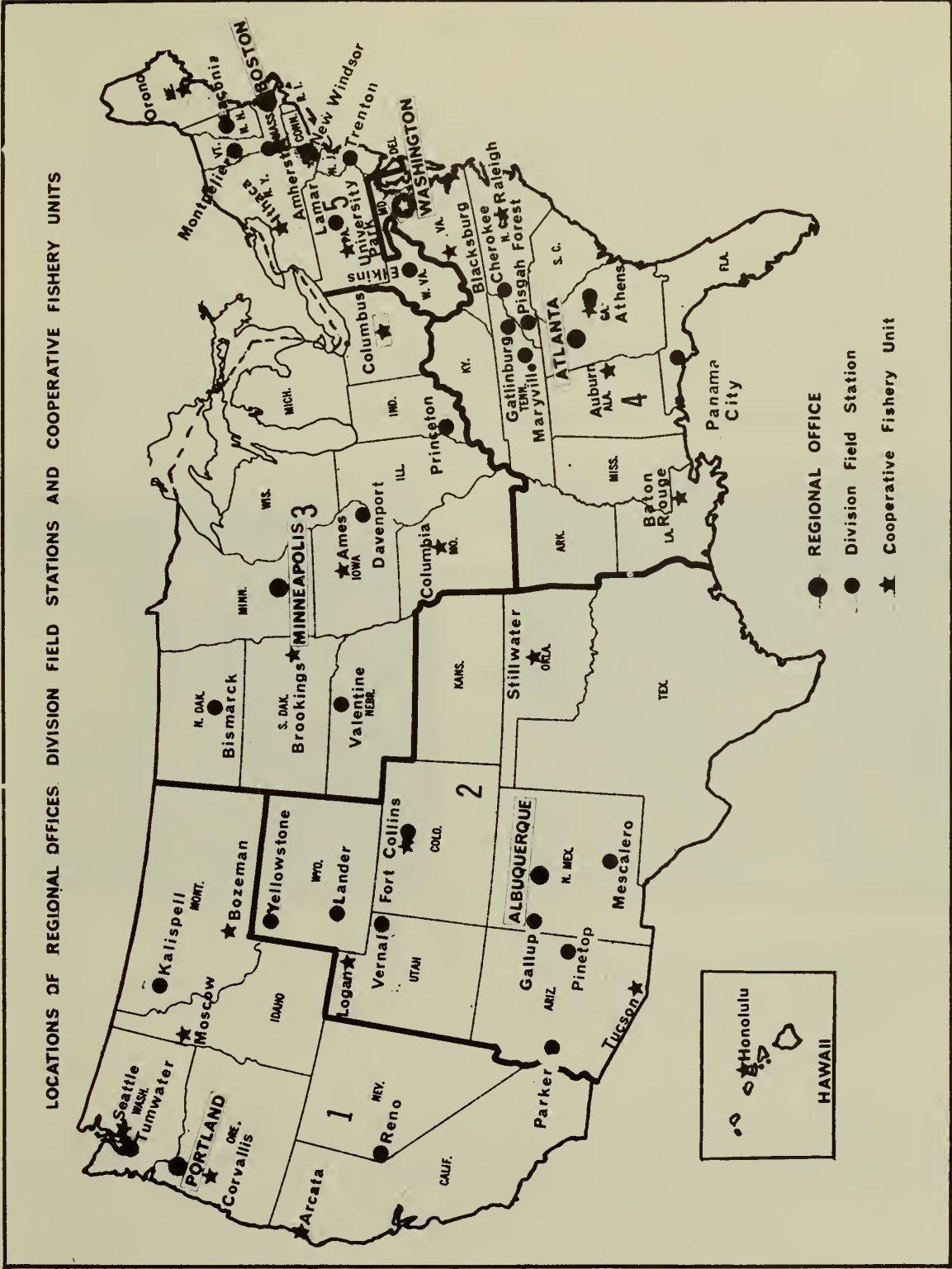


Figure 1. --Locations of Regional Offices, Division Field Stations, and Cooperative Fishery Units.

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Introduction

Fishery Services was established in 1957 with a staff of 16 fishery biologists. It was known first as the Branch of Fishery Management Services; then the Division of Fishery Management Services in 1963; and finally the Division of Fishery Services in 1965. Prior to 1957 some phases of the program were conducted under the Section of Fisheries Management, Branch of Game-fish and Hatcheries. The Division has grown during the years and has added new responsibilities such as fish pesticide monitoring and the Cooperative Fishery Unit program. Today, when at full compliment, there are 108 highly qualified professionals in the Division.

DIVISION OF FISHERY SERVICES ANNUAL REPORT FOR 1969

The primary objective of the Division of Fishery Services is to provide sport fishing for the present and future by improving the existing sport fishery and developing new sport fisheries through the application of modern fishery management techniques learned from research and experience.

The Division carries out this objective as follows:

1. By providing guidance to Federal landowner agencies in the development and execution of fishery management programs so as to make the maximum fishing available without undue interference with the primary objectives of the areas.



Commanding Officer of Ft. McPherson, Georgia, assists biologists in stocking channel catfish pond.



Division field biologists sort, weigh, and measure fish from sample at Allegheny National Forest.

In 1969, Division of Fishery Services biologists provided fishery management assistance to 243 Federal areas. These lands encompass 11,958 miles of streams and 435 thousand acres of lakes and impoundments under management. During the year, 5.9 million man-days of fishing occurred on these areas, which was a 10 percent increase over 1968.

2. By providing technical assistance for fishery management programs on Indian reservations.



Cherokee Indian Fishery Wardens release catchable size trout in reservation waters that provided 50,000 angling trips in 1969.

Fishery Services biologists assisted 62 Indian tribes in 1969 with their fishery programs. Some 1.5 million man-days of sport fishing were enjoyed by Indians and the general public. This was a 21 percent increase in angling trips over 1968.



Secretary Walter J. Hickel and Division biologist discuss fishery management potential of Tyonek Indian Reservation.

3. By assuring that the fish produced at national fish hatcheries are stocked in such a manner as to provide maximum fishing to the anglers; and to provide the necessary information which will help gear hatchery production to stocking requirements.



Division of Fishery Services and Fish Hatcheries personnel load trout distribution boat for stocking Dale Hollow Reservoir.

In 1969, the Division of Fish Hatcheries provided nearly 41 million fish (3 million pounds) for waters that are managed by Fishery Services personnel. Biologists reported 8.7 million angling trips on 559 areas receiving assistance from the Division of Fishery Services, an increase of 0.2 million over 1968.

4. By cooperating with, and providing assistance to, the 50 States in their fishery management programs where there are mutual State-Federal interests. Duplication of effort is avoided and accomplishments are greater when both agencies work together.



Bureau and State biologists plan cooperative management program on Connecticut River.

The Division of Fishery Services maintains close coordination with the States on activities of mutual interest. Regularly scheduled meetings are held with the State fish and game departments regarding cooperative fish stocking programs. Other cooperative projects include fishery surveys, creel censuses, limnological studies, fish control operations, pesticide monitoring and field appraisal, reservoir studies, anadromous fish programs, and pollution investigations. The success of many sport fishery programs is a direct result of the close teamwork between State and Division fishery biologists.

5. By participation in programs of training and studies at colleges and universities and by the establishment of Cooperative Fishery Units at colleges and universities.



Georgia Cooperative Fishery Unit Leader directs graduate students in the complete inventory of the fish population of Lake Russell.

Cooperative Fishery Units are located at 23 colleges and universities across the country (see locations in Figure 1). While the primary function of the unit is to train students in fisheries or related fields, they accept numerous other projects. These include extension services, research projects, faculty activities, and consulting. The unit staff and students participate in management activities of interest to the States and the Bureau.

6. By pesticide monitoring and appraisal, Division personnel participate in the National Pesticide Monitoring Program whereby fish are collected from 50 watersheds in the United States to determine pesticide concentrations. Several of the Cooperative Fishery Units are involved in research related to pesticides in the aquatic environment.

NATIONAL PESTICIDE MONITORING—FISH



This map indicates the site and river on which annual samples of fishes have been collected to determine pesticide concentrations by laboratory analyses. In 1969 fish were checked for DDE, TDE, DDT, Dieldrin, BHC, Heptachlor, Heptachlor Epoxide, Chlordane, PCB's, Lipids, Aldrin, Endrin, Lindane, and Toxaphene. Three different species are collected at each station.

7. By making available information to the public on fishery management and research through extension-type activities and printed material.



Division biologist supervises conservation camp demonstration on farm pond management. Such topics as pond fertilization, fish population balance, spawning success, stocking ratios, food habits, and angling techniques are among the subjects presented at these appearances.

Public services provided by the Division include participation in workshops; demonstrations of various management techniques; conservation exhibits; and numerous talks on fisheries to conservation organizations, civic groups, and youth groups. Biologists frequently appear on radio or television programs devoted to conservation.

Fishery Management Programs on Department of Defense Areas

Division activities on Department of Defense lands are carried on under cooperative agreements and plans under Public Law 86-797, the Sikes Act (74 Stat. 1052) and a Memorandum of Understanding, dated July 11, 1960, between the Department of Defense and the Department of the Interior. These cooperative agreements are signed by a representative of the military base, the Bureau of Sport Fisheries and Wildlife, and usually the State fish and game department. Activities are coordinated with other Federal and State agencies which have an interest in the program.



Vital to the knowledge of fishery management is an understanding of the chemistry of a body of water. Here fishery biologist Don Bartschi carries out this task at an Air Force Academy pond.

Fishery management services were provided to 131 Department of Defense installations during 1969. This represents a decrease of approximately 13 percent from last year's activities. Fish management activities on military lands are usually adapted to a long-range plan which takes into consideration the primary objectives of the installation.

Department of Defense Areas Served During 1969

<u>State</u>	<u>Air Force</u>	<u>Army</u>	<u>Navy & Marine Corps</u>	<u>State</u>	<u>Air Force</u>	<u>Army</u>	<u>Navy & Marine Corps</u>
Ala		2		Nev			1
Ariz		2		N.H.	2		
Ark		2		N.J.		2	2
Calif	4	5	5	N. Mex		1	
Colo	2	4		N.Y.	2	3	
Fla	6		5	N.C.		2	2
Ga	1	5	1	Ohio	3	2	
Ill	2	1		Okla	1	2	1
*Ind		3		Ore	1		
Iowa		1		Pa		6	
Kans		2		R.I.			5
Ky		1		S.C.	2	1	1
La	1			S. Dak	1		
Maine	1		2	Tenn		3	1
Md	1	4	3	Utah	1	2	
Mass	2	2		Va		11	6
Mich	2			Wash	2	3	1
Miss			1	Wis		1	
Mont	1			Wyo	1		
Nebr	1						

* One Coast Guard.



Bureau and Department of Defense personnel in attendance of annual training session and "show me" tour of military fishing waters under management, sponsored by the Division in Region 4.



Seining to determine growth and reproduction success at a Fort Gordon pond.



Division biologist and student aid examine suckers and bullheads during pond renovation at an army base.

Fishery management services are provided to National Forests and Grasslands in accordance with a Memorandum of Understanding between the U.S. Forest Service and the U.S. Fish and Wildlife Service in cooperation with State fish and game agencies. Assistance provided to the Forest Service consists of fishery investigations, stocking and management recommendations, habitat reclamation and improvement, creel census, developing overall watershed management programs, and compiling water inventories for incorporation in the Forest Service's long-range total use plans.

In 1969, the Division of Fishery Services was active on 14 Forest Service areas. These areas contain over 21,000 acres of lakes, ponds, and impoundments and 5,900 miles of streams. They provided approximately 1.8 million angling trips and were stocked with 5.9 million fish from Bureau hatcheries.

The activities carried out at White Mountain National Forest in Maine and New Hampshire are typical of the Division's program on Forest Service areas. They include stream surveys; lake surveys; stocking recommendations involving nearly 200,000 catchable trout; and a special project evaluating the catchable trout stocking program on Peabody River. This led to a reduction of 30 percent in the number of fish released without decreasing the angling quality. In 1969, over 140 thousand man-days of fishing were reported for the White Mountains.



Division biologist Tom Groutage collecting water samples at Kinzua Dam in Allegheny National Forest.

National Forests Receiving Technical Assistance

<u>State</u>	<u>National Forest</u>
Georgia	Chattahoochee
Illinois	Shawnee
Kentucky	Daniel Boone
Maine & New Hampshire	White Mountain
Nebraska & South Dakota	Central Plains
North Carolina	Nantahala
North Carolina	Pisgah
Pennsylvania	Allegheny
South Carolina	Francis Marion
South Carolina	Sumter
Vermont	Green Mountain
Virginia & West Virginia	George Washington
Virginia & West Virginia	Jefferson
West Virginia	Monongahela



Biologist and student aids conducting stream survey in Allegheny National Forest.

Fishery Management Programs on National Park Service Lands

In 1966, a Memorandum of Understanding between the Bureau of Sport Fisheries and Wildlife and the National Park Service was approved by the Assistant Secretary of the Interior for Fish and Wildlife and Parks to provide fishery management assistance for Park Service waters. The Division of Fishery Services assisted 10 Park Service areas in their fishery resource programs during 1969. These areas recorded nearly one million angler trips on 2,839 miles of streams and 135,775 acres of lakes and ponds.

Division field stations are located at Yellowstone National Park and Great Smoky Mountains National Park. At Yellowstone two Division biologists and several seasonal student aids carry out comprehensive investigations on the many streams and lakes. Evaluation of these studies has led to regulation changes which help maintain the quality angling found at Yellowstone Park.

The Division biologist assigned to the Great Smokies also provides the fishery management expertise for the Blue Ridge Parkway. The Parkway, which follows the crest of the Blue Ridge Mountains in North Carolina and Virginia, has 13 lakes and over 100 miles of streams that provided approximately 27,000 man-days of fishing in 1969.



An angler stops to review regulations on a Blue Ridge Parkway "artificial flies only" stream in North Carolina.



Division personnel collecting data from fall netting samples at Yellowstone Lake.



Biologists remove scales from a cutthroat trout for age and growth study at Yellowstone National Park.

Parks Receiving Technical Assistance

State

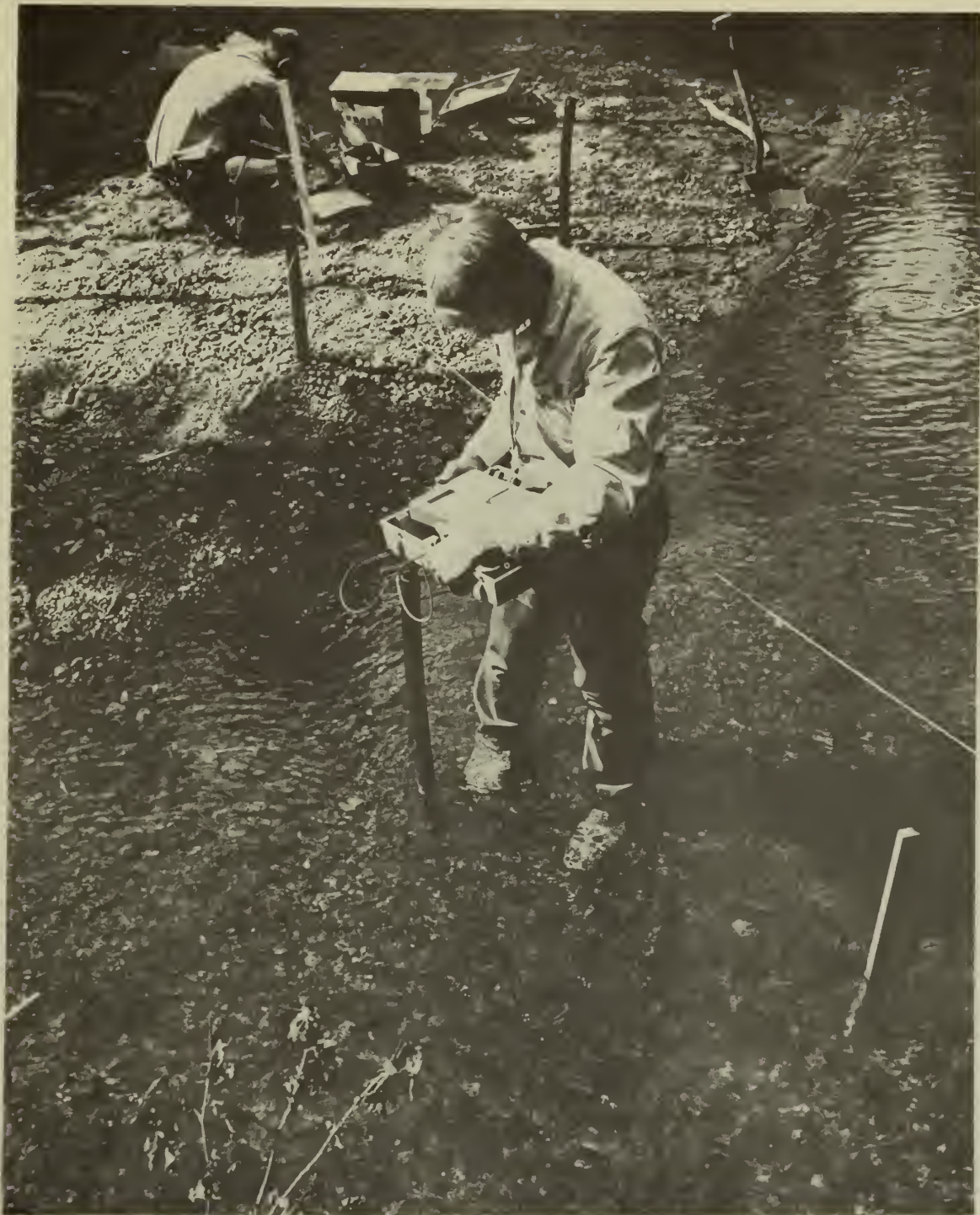
Colorado
Kentucky, Tennessee, & Virginia
Montana
North Carolina & Virginia
North Carolina & Virginia
Virginia
Virginia
Washington
Washington
Wyoming, Idaho, & Montana

National Park

Rocky Mountain
Cumberland Gap
Glacier
Blue Ridge Parkway
Great Smoky Mountains
Prince William Forest
Shenandoah
Mount Rainier
Olympic
Yellowstone



Fly fisherman works the flat water of Abrams Creek in the Great Smoky Mountains National Park. The Smokies, where trout fishing is open all year, had a quarter million angling trips in 1969.



Division biologist and student aid seen conducting studies on cutthroat trout redds in tributary stream to Yellowstone Lake.

The changing pattern in Federal attitude is reflected in the emphasis on public use of National Wildlife Refuges. Sport fishing is one of the more popular forms of recreation which may be permitted without seriously interfering with the primary objective of the refuge. There are many lakes, ponds, and streams open to the public for fishing, and it is the responsibility of the Bureau to see that these waters are properly managed.

The Division of Fishery Services provided technical assistance to 57 refuges in 1969. Nearly 245 thousand acres of lakes and ponds and 1,694 miles of streams were managed to produce about 1.5 million man-days of fishing.



Surf fishing at Pea Island National Wildlife Refuge.



Division of Fishery Services and Division of Wildlife Refuges personnel prepare to carryout lake renovation to eliminate trash fish at Valentine NWR.



Student aid displays two large gar taken during renovation project at Delta NWR.

Fishery Management Programs on Miscellaneous Federal Areas

Forty small Federal areas were provided technical assistance in their fishery management programs during 1969. Veterans Administration hospitals, a Federal Youth Center, Federal Prisons, and the Soldiers Home were included in this category. Angling pressure is frequently intense on many of the small areas. On one VA hospital, fishery pressure exceeded 5,000 trips per acre.



Patients fish at lake managed by the Division at Valley Forge Central Hospital in Pennsylvania.

Fishery Management Programs on Indian Reservations

A most important and rewarding activity of the Division is the Indian tribe fish management program. In 1969, Fishery Services biologists assisted 62 Indian reservations with their fish management activities. Over 1.5 million man-days of fishing occurred on nearly 200 thousand acres of ponds and lakes and 4,286 miles of streams. The fishing was enhanced by stocking 8.2 million fish from Bureau hatcheries.

The development of sport fishing programs has resulted in a major tourist attraction on several Indian reservations. Sportsmen obviously enjoy the fine angling found on the many scenic reservations and substantial monetary benefits are realized by the tribes. The fishery programs also provide direct full-time employment for a significant number of tribal members.



Back country lakes such as the one pictured here on the Wind River Indian Reservation are included in the fish management program.



Aerial view of salmon nets set at the Quinault Indian Reservation in Washington.



Summit Lake Indians in Nevada took nearly 2 million Lahontan cutthroat trout eggs from fish in the reservation lake in 1969 for their enterprise program.



This boat dock operation at Sheep Creek Reservoir helped the economy of the Duck Valley Indian Reservation. It is a favorite trout lake in Nevada.



California anglers are attracted to the Tule River Indian Reservation where fishing is supported by a trout stocking program.

There are a number of indirect economic benefits resulting from the sport fishing programs. The development of motels, restaurants, tackle and bait shops, boat liveries, campgrounds, and guide service usually follows the establishment of fish management programs.

The Fort Apache and Cherokee Indian Reservations have progressive expanding fish management programs which provide outstanding fishing for the public and have achieved national recognition.

Numerous small reservations and pueblos also have excellent fishery programs. Typical of these is the Isleta Pueblo near Albuquerque, New Mexico. The Indians have constructed a recreational complex open to the public centered about two fishing lakes which includes picnic areas, campsites, and a concession stand.



Opening day fishing scene at the Isleta Pueblo.

Indian Reservations Served During 1969

Arizona: (12) Colorado River; Fort Apache; Fort McDowell; Gila River; Havasupai; Hopi; Hualapai; Maricopa; Navajo; Papago; Salt River; San Carlos

California: (3) Colorado River; Hoopa Valley; La Jolla

Colorado: (4) Fort Yuma; Southern Ute; Tule River; Ute Mountain

Florida: (1) Seminole

Idaho: (2) Duck Valley; Fort Hall

Minnesota: (3) Grand Portage; Red Lake; White Earth

Mississippi: (1) Choctaw

Montana: (6) Blackfeet; Flathead; Fort Belknap; Fort Peck; Northern Cheyenne; Rocky Boy's

Nebraska: (1) Winnebago

Nevada: (4) Duck Valley; Pyramid Lake; Summit Lake; Walker River

New Mexico: (12) Acoma Pueblo; Jemez Pueblo; Jicarilla; Laguna Pueblo; Mescalero Apache; Nambe Pueblo; Navajo; Picuris Pueblo; Santa Clara; Southern Ute; Ute Mountain; Zuni Pueblo

New York: (1) Seneca

North Carolina: (1) Cherokee

North Dakota: (4) Cheyenne River; Fort Totten; Standing Rock; Turtle Mountain

Oregon: (2) Umatilla; Warm Springs

South Dakota: (3) Crow Creek; Pine Ridge; Rosebud

Utah: (1) Uintah-Ouray

Washington: (6) Colville; Lower Elwha; Makah; Quinault; Tulalip; Yakima

Wyoming: (1) Wind River

Cooperative Fishery Units

The enactment of Public Law 86-686 (74 Stat. 733) in 1960 saw the beginning of the Cooperative Fishery Unit program. The Act's stated purpose is "To facilitate cooperation between the Federal Government, colleges and universities, the States, and private organizations for cooperative unit programs of research and education relating to fish and wildlife and for other purposes." The ten-year period has seen the program grow to 23 units across the Nation.

Each fishery unit is a cooperative undertaking involving the Bureau of Sport Fisheries and Wildlife, a college or university, and a State conservation department. A coordinating committee, representing the participating agencies, provides general guidance to each unit, including review of proposals for graduate studies and budgets. The Bureau provides two highly trained fishery biologists to serve as unit leader and assistant leader.

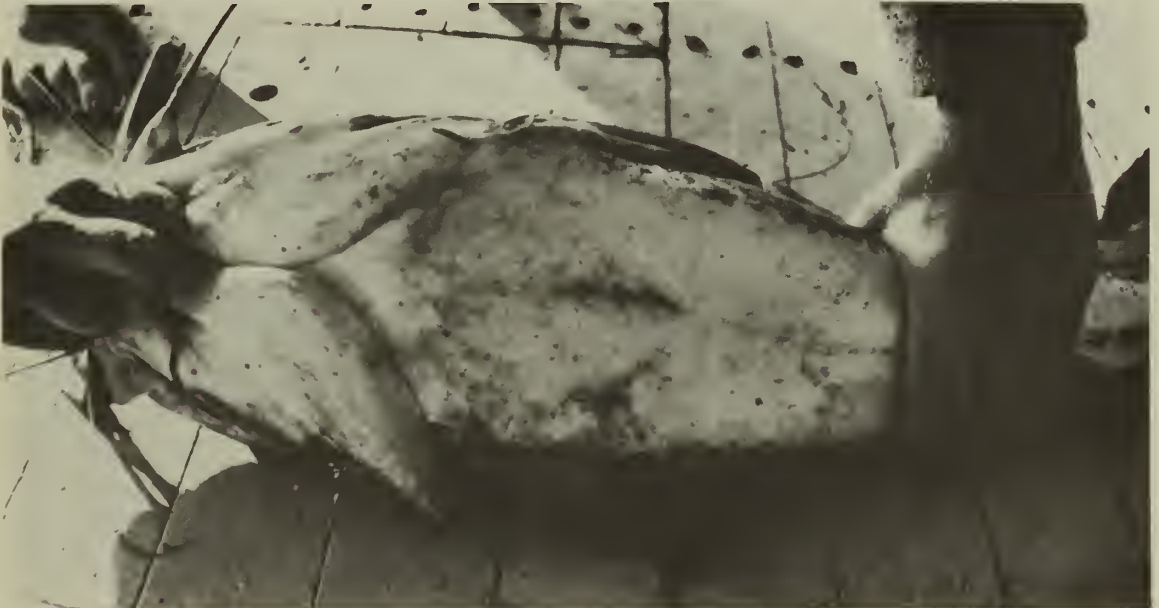
The recent Bureau of Sport Fisheries and Wildlife Resource Publication 80 provides a Cooperative Fishery Unit report for the period of January 1968 through June 1969.



Georgia Unit students examine a farm pond fish population.

Cooperative Fishery Unit Locations

Alabama, Auburn University, Auburn
Arizona, University of Arizona, Tucson
California, Humboldt State College, Arcata
Colorado, Colorado State University, Fort Collins
Georgia, University of Georgia, Athens
Hawaii, University of Hawaii, Honolulu
Idaho, University of Idaho, Moscow
Iowa, Iowa State University, Ames
Louisiana, Louisiana State University, Baton Rouge
Maine, University of Maine, Orono
Massachusetts, University of Massachusetts, Amherst
Missouri, University of Missouri, Columbia
Montana, Montana State University, Bozeman
New York, Cornell University, Ithaca
North Carolina, North Carolina State University, Raleigh
Ohio, Ohio State University, Columbus
Oklahoma, Oklahoma State University, Stillwater
Oregon, Oregon State University, Corvallis
Pennsylvania, Pennsylvania State University, University Park
South Dakota, South Dakota State University, Brookings
Utah, Utah State University, Logan
Virginia, Virginia Polytechnic Institute and State University, Blacksburg
Washington, University of Washington, Seattle



Sonic tags are surgically implanted in the body cavity of catfish by Idaho Unit in studies in Zambia, Africa.

Cooperation with the Division of Fish Hatcheries

A close working relationship between the Divisions of Fish Hatcheries and Fishery Services is necessary to provide the American public with better angling at the most economical level. Fish Hatchery and Fishery Services personnel meet annually with State fish and game departments to determine State requirements and plan stocking schedules for fish from national fish hatcheries.

During 1969, more than 40 million fish weighing 3 million pounds were stocked from national fish hatcheries on programs receiving guidance from Fishery Services. Federal areas and Indian reservations were stocked with 18.8 million fish weighing 1.6 million pounds. Federal-State cooperative areas received 21.3 million fish that weighed 1.4 million pounds.



Division of Fishery Services and Division of Fish Hatcheries personnel mark fish for Choctawhatchee Bay study in Florida.

Pesticide Field Appraisal, Monitoring, and Research

The Division has four biologists who devote the majority of their time to pesticide programs. In addition, several field biologists and personnel in the Cooperative Fishery Units are active in pesticide work. Fishery Services personnel from all regions collected fish for the fall samples of the National Pesticide Monitoring Program at 50 stations across the country. The samples were analyzed by the Wisconsin Alumni Research Foundation for residues of chlorinated hydrocarbons as well as total fat. In addition, polychlorinated biphenyls (PCB's) were estimated. During the year, previous data on the chlorinated hydrocarbons in the fish samples at these stations were published in the Pesticide Monitoring Journal. Field appraisals of the impact on aquatic organisms of pesticide applications included malathion and pyrethrin. Several fish kills investigated by the Division were attributed to pesticides.



Biologists prepare to observe the effects of a pesticide operation.

Coordination Projects

Connecticut River Anadromous Fisheries Program

The Division of Fishery Services is actively engaged in an effort to restore American shad and Atlantic salmon to their historic ranges in the Connecticut River Basin. As in the past, power companies having installations on the river impeding migration provided funds for fishery studies. A "fish crowder" was installed at the Holyoke, Massachusetts, fish passage facility; and as a result of this measure, a record number of shad was passed over the dam. In addition to 45,000 shad, more than 20,000 alewives and river herring were lifted in the fish elevator to continue their upstream journey to spawning reaches of the river. During the year, 17,000 Atlantic salmon smolts were released below Holyoke Dam--a program that may lead to the reestablishment of this excellent sport fish.

Delaware River Anadromous Fish Restoration Program

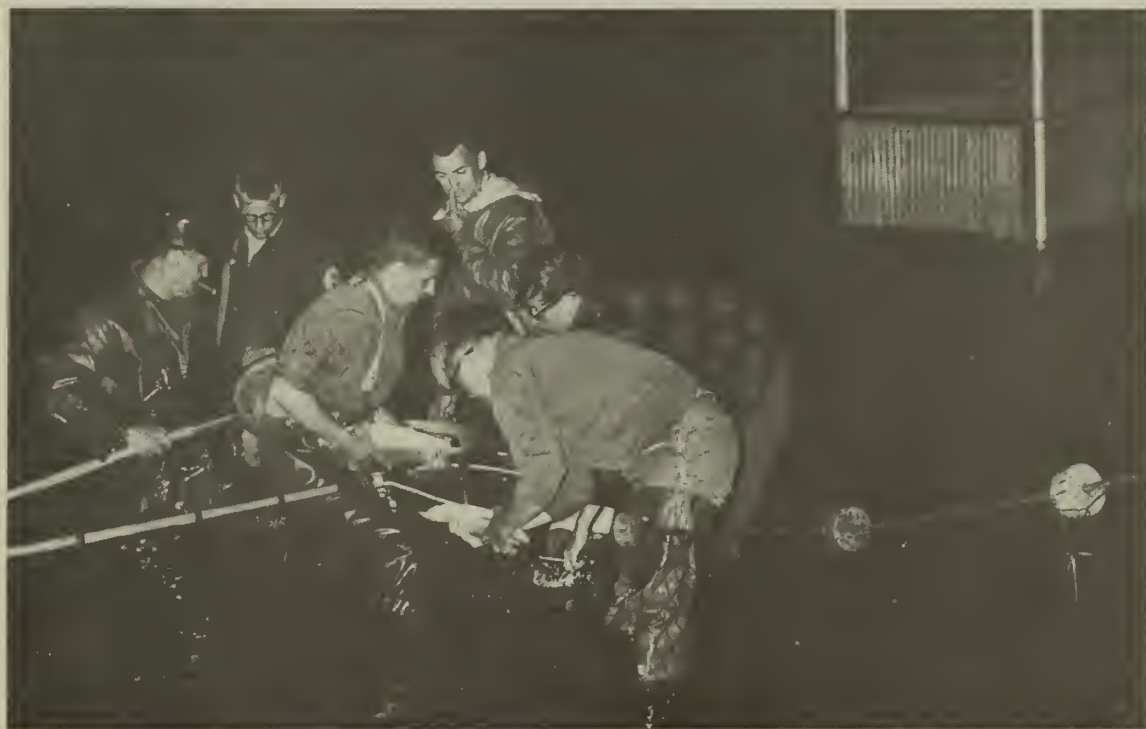
Field work during 1969 has provided additional knowledge of the American shad in the Delaware River. Data collecting from tagging; macroinvertebrate study; distribution investigations by time and place of adults and juveniles; feeding habits; and pollution zone effects on fish are among the activities being conducted by this project. The program is contracted with New Jersey and Pennsylvania through the Anadromous Fish Act.

Hudson River Fisheries Investigations

Ecological studies on the Hudson River were continued by the Division in 1969. A Division Coordinator carries out the field activities which are presented to a Technical Committee for review and evaluation. A Hudson River Policy Committee composed of the Regional Directors of the Bureau of Sport Fisheries and Wildlife and the Bureau of Commercial Fisheries and the Directors of the New York and the New Jersey State conservation agencies provides top level guidance. Proposed studies and activities of these two groups are presented to the Consolidated Edison Company of New York, Inc. for review and approval. Presently, a study of physical and biological effects of heated effluent on river ecology is under way. A report entitled "Hudson River Fisheries Investigations 1965-1968 With an Appendix" was recently published.



Hudson River Fisheries Investigation biologists collecting data on fish distribution.



Night egg taking operation of American shad.

Upper Mississippi River Conservation Committee

A Division biologist serves as the Coordinator of the UMRCC. The program has made outstanding progress in coordinating fishery activities of State and Federal agencies involved in managing 612 miles of the Mississippi River. The Coordinator edits a quarterly newsletter and has contributed to several publications on the UMRCC. The latest, released in 1969, entitled "25 Years of Conservation Through Cooperation" tells the story of the UMRCC.

As a member of the steering committee, the Coordinator prompted the establishment of the Mississippi River Research Consortium held annually. Activities related to the proposed National Recreation Area and a 12-foot channel occupied much of the work schedule during the past year.



Division biologist Bill Daugherty releases Atlantic salmon smolts into Connecticut River.

Colorado River Storage Project

The Division of Fishery Services performs staff functions by assisting the Coordinator, Colorado River Storage Project, in the inspection of fishery work performed under Section 8, Public Law 458, 84th Congress. The Project Leader, Vernal, Utah, Division Field Station, is responsible for contractual inspection of fishery investigations on Flaming Gorge, Navajo, Powell, and Blue Mesa Reservoirs. Division personnel of the Bureau's regional office in Albuquerque assist with the evaluation of the fishery investigation proposals.



Biologist carries out creel interviews on Flaming Gorge Reservoir during angler's lunch break.

Dale Hollow Reservoir Investigation, Tennessee and Kentucky

This cooperative study is concerned with developing a management program, including stocking, for a "second-story" trout fishery in this 27,000-acre southeastern reservoir. Various size trout have been stocked at different seasons and locations since 1966. Data are being collected on the thermal-chemical lake strata, trout returns to the creel, trout distribution (vertical and horizontal), trout food habits, and growth. Approximately 568,000 rainbow trout were stocked in the reservoir during the year. Some 470,000 were released beneath the epilimnion (50 feet) after first being placed at equilibrium for this depth in a pressure tank (see photos). Evaluation of these studies will help formulate management guidelines for trout stocking in other two-story reservoirs in this region.

Agencies involved in the study are the Bureau of Sport Fisheries and Wildlife, the States of Tennessee and Kentucky, and the Corps of Engineers.



Closeup view of Division biologists working pressure tank that released trout at the 50-foot depth.



Nearly 1/2 million rainbow trout were successfully "shot" from the pressure tank and down the irrigation pipe into cold-water habitat of Dale Hollow Reservoir.

Choctawhatchee Bay Striped Bass Study

A coordinated study was initiated on Choctawhatchee Bay, Florida, by the Divisions of Fishery Services, Fishery Research, and Fish Hatcheries in cooperation with the Florida Game and Fresh Water Fish Commission, the Florida Board of Conservation, Eglin Air Force Base, and local organizations.

The Division of Fishery Services has assigned a fishery biologist full time to this project to direct program activities. An environmental study of the 100,000-acre estuary is underway. Since the initial stocking in 1968, approximately 351,000 fingerling and subadult striped bass have been planted in the Bay. Recapture information of stocked striped bass has been encouraging. Subadult fish have been marked for identification purposes. The length of time from stocking to recapture has varied from two months to one year, and growth of the fish has been good.



Young striped bass raised at a national fish hatchery and tagged prior to release into Choctawhatchee Bay.

Rare and Endangered Species

The Division, including the Cooperative Fishery Units, field stations, regional offices, and central office, has become deeply involved in this program. The Division is active in study on about one-third of the more than 100 species on the R & E list. They include such fish as the Atlantic salmon, several species of cutthroat trout, Sunapee trout, Apache trout, humpback chub, Colorado River squawfish, Nevada pupfish, Atlantic sturgeon, Gila topminnow, several species of darters, and the blue pike.



Pictured is a darter which is listed in the Bureau's red book of rare and endangered fish and wildlife of the United States.

Urban Fishing Program

In 1969 the Bureau, in cooperation with several State, local, and other Federal agencies, initiated a fishing program in urban areas and especially for children from the innercity. Of the six cities which had an Urban Fishing Program, the Division directed four of these at Portland, Oregon; St. Louis, Missouri; Atlanta, Georgia; and Boston, Massachusetts. The other two sites were located at Washington, D.C. and Fort Worth, Texas. It was estimated that nearly 66,000 fishing trips took place during the summer. Of this number, 50,000 trips were recorded at the St. Louis project which was directed by the Division staff from the Central States Fishery Station, Princeton, Indiana, with considerable assistance and equipment from the Division of Fish Hatcheries. Though many problems arose during the operation, the program was considered successful and beneficial for the participants. During the winter the Division made plans to renew the program in 1970.



Kids from Boston's innercity fish for the first time at Hale Reservoir in the Bureau's Urban Fishing Program.

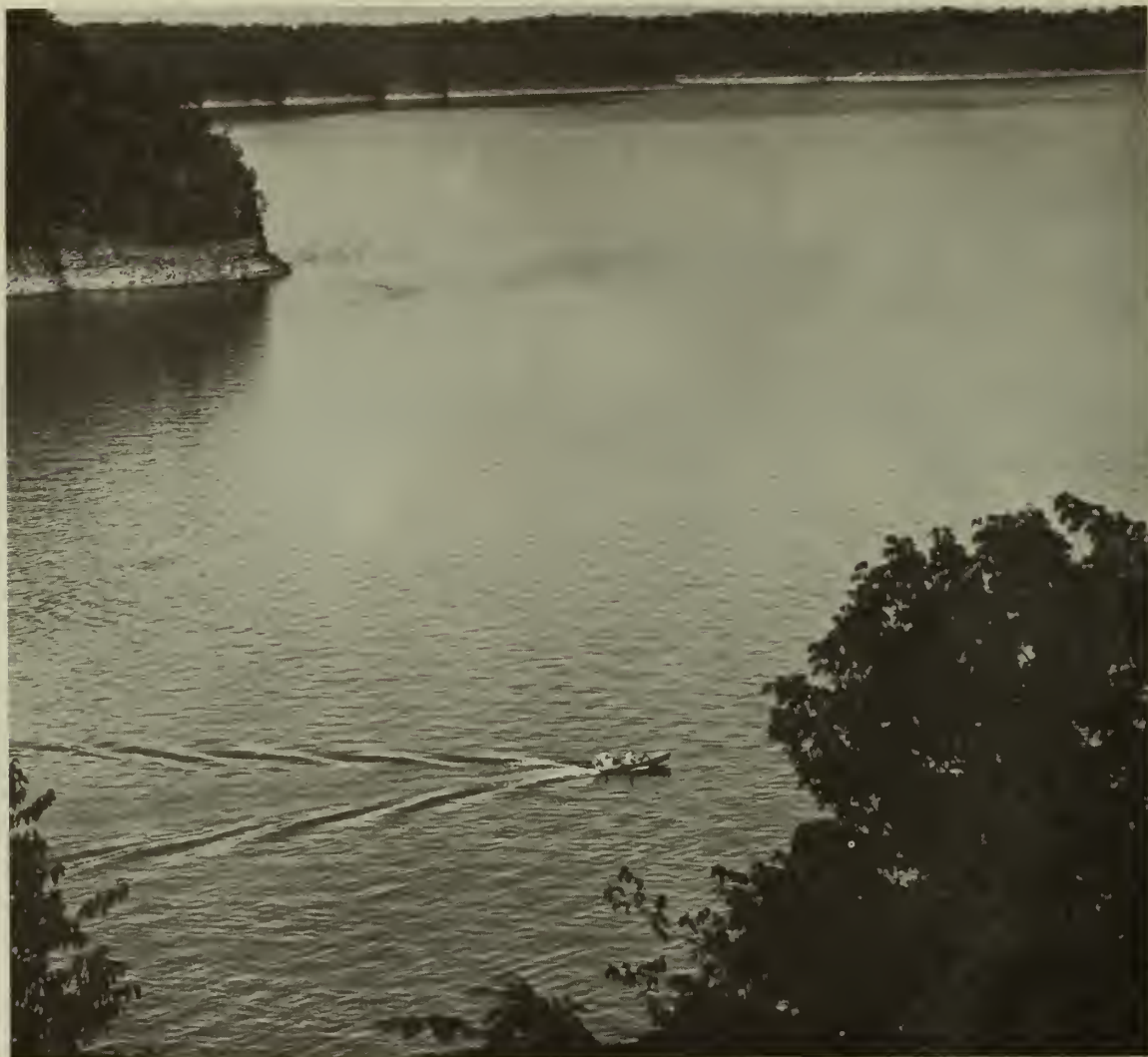
Miscellaneous Activities

Division biologists are involved in a diversity of other activities. They are frequently called on to present conservation programs to civic and service organizations and sportsmen clubs and to assist in summer conservation workshops for school teachers. Fishery Services personnel are active in their professional societies. During the past year, several were officers and some held important committee assignments. In-service training for all Division personnel is a continuing policy. This activity included such diverse subjects as a Defensive Driving Course to an Environmental Management Seminar.



Division biologist provides the expertise for West Point Boy Scout Stillwell Lake improvement project--here constructing brush shelters.

A close relationship is maintained at the regional and field levels with State fish and game agencies, and many cooperative projects and investigations were carried on during 1968. Additional cooperative activities included fishery investigations and stocking at Corps of Engineers' reservoirs, tagging and marking studies, fish population surveys, assistance in evaluation of proposed Soil Conservation Service projects, and providing manpower and equipment for special projects. The State agencies are kept informed of management programs and projects of mutual concern.



State and Division biologists make early morning run of gill nets at Corps of Engineers reservoir in Kentucky during lake survey.

Fishery biologists in Regions 3 and 5 have been active in the study of the effects of acid mine drainage. Cooperative Fishery Units are also directing research on pollution from mining activities. In the general field of environmental pollution, a Division biologist was designated as the Bureau's onsite coordinator for the Santa Barbara Channel oil spill incident.



"Our Product."

Table 1. -- Summary of Fishery Services on All Areas Served, 1969

	R E G I O N					Total
	1	2	3	4	5	
Areas visited	37	90	107	209	116	559
Reports submitted	17	55	31	174	38	315
Waters under Management Acres of Lakes & Ponds	208,883	304,615	70,495	326,780	27,802	938,575
Miles of Streams	3,658	2,592	56	7,562	1,482	15,377
Acres of Fish Habitat Reclaimed or Improved	1,011	1,859	189	170	79	3,308
Miles of Stream Reclaimed or Improved	1	26	32	2	-	61
Acres of New Waters Developed	690	148	611	1,042	135	2,626
Man-Days of Fishing	1,061,232	2,913,920	678,038	2,740,382	1,348,631	8,742,203
Pounds of Hatchery Fish	1,032,772	708,559	64,432	503,898	755,088	3,064,749
Number of Hatchery Fish	17,494,490	9,241,294	1,757,632	4,844,420	7,601,245	40,939,081

Table 2. -- Summary of Fishery Services on Federal Areas & Indian Reservations, 1969

	R E G I O N					Total
	1	2	3	4	5	
Areas visited	37	70	48	113	37	305
Reports submitted	16	44	28	86	29	203
Waters under Management Acres of Lakes & Ponds	208,882	131,692	69,927	191,678	27,337	629,516
Miles of Streams	3,685	2,501	56	7,530	1,472	15,244
Acres of Fish Habitat Reclaimed or Improved	1,011	1,859	180	170	63	3,283
Miles of Stream Reclaimed or Improved	1	26	32	2	-	61
Acres of New Waters Developed	690	148	464	1,042	62	2,406
Man-Days of Fishing	1,059,632	1,902,175	620,588	2,499,259	1,334,892	7,416,546
Pounds of Hatchery Fish	361,585	470,374	27,810	407,097	343,906	1,610,772
Number of Hatchery Fish	4,681,249	3,233,814	1,702,794	3,077,984	6,150,795	18,846,636

Table 3. -- Summary of Fishery Services on Department of Defense Areas, 1969

	R E G I O N					Total
	1	2	3	4	5	
Areas visited	9	19	9	77	17	131
Reports submitted	6	8	5	53	15	87
Waters under Management Acres of Lakes & Ponds	13,329	1,482	339	7,145	753	23,048
Miles of Streams	38	4	13	378	30	463
Acres of Fish Habitat Reclaimed or Improved	135	44	9	170	16	374
Miles of Stream Reclaimed or Improved	1	-	-	-	-	1
Acres of New Waters Developed	25	7	-	130	-	162
Man-Days of Fishing	163,183	158,699	119,037	912,587	140,951	1,494,457
Pounds of Hatchery Fish	52,982	46,285	7,521	47,206	19,276	173,270
Number of Hatchery Fish	332,748	195,756	24,415	525,865	75,930	1,154,714

Table 4.-- Summary of Fishery Services on Air Force Bases, 1969

	R E G I O N					
	1	2	3	4	5	Total
Areas visited	4	5	5	17	4	35
Reports submitted	3	2	3	9	6	23
Waters under Management Acres of Lakes & Ponds	338	107	258	1,275	137	2,115
Miles of Streams	18	-	-	-	-	18
Acres of Fish Habitat Reclaimed or Improved	-	10	8	-	-	18
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-
Man-Days of Fishing	43,750	41,019	90,800	247,918	24,220	447,707
Pounds of Hatchery Fish	16,335	20,513	7,204	918	2,805	47,775
Number of Hatchery Fish	75,119	76,809	21,833	38,000	10,500	222,261

Table 5.-- Summary of Fishery Services on Army Installations, 1969

	R E G I O N					Total
	1	2	3	4	5	
Areas visited	1	13	4	44	10	72
Reports submitted	1	6	2	27	7	43
Waters under Management Acres of Lakes & Ponds	634	575	81	3,766	572	5,628
Miles of Streams	20	4	13	328	29	394
Acres of Fish Habitat Reclaimed or Improved	135	34	1	170	16	356
Miles of Stream Reclaimed or Improved	1	-	-	-	-	1
Acres of New Waters Developed	25	7	-	58	-	90
Man-Days of Fishing	68,670	113,180	28,237	553,597	108,315	871,999
Pounds of Hatchery Fish	27,444	25,752	317	41,293	14,755	109,561
Number of Hatchery Fish	185,939	117,932	2,582	432,878	56,110	795,441

Table 6.-- Summary of Fishery Services on Navy & Marine Bases, 1969

	R E G I O N					
	1	2	3	4	5	Total
Areas visited	4	1	-	16	3	24
Reports submitted	2	-	-	17	2	21
Waters under Management Acres of Lakes & Ponds	12,357	800	-	2,104	44	15,305
Miles of Streams	-	-	-	50	1	51
Acres of Fish Habitat Reclaimed or Improved	-	-	-	-	-	-
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	72	-	72
Man-Days of Fishing	50,763	4,500	-	111,072	8,416	174,751
Pounds of Hatchery Fish	9,203	20	-	4,995	1,716	15,934
Number of Hatchery Fish	71,690	1,015	-	54,987	9,320	137,012

Table 7. -- Summary of Fishery Services on National Forests, 1969

	R E G I O N					
	1	2	3	4	5	Total
Areas visited	-	-	2	8	6	14*
Reports submitted	-	-	1	4	10	15
Waters under Management Acres of Lakes & Ponds	-	-	264	9,694	11,044	21,002
Miles of Streams	-	-	6	4,517	1,400	5,923
Acres of Fish Habitat Reclaimed or Improved	-	-	11	-	47	58
Miles of Stream Reclaimed or Improved	-	-	-	2	-	2
Acres of New Waters Developed	-	-	20	903	62	985
Man-Days of Fishing	-	-	9,116	843,060	915,792	1,767,968
Pounds of Hatchery Fish	-	-	3,513	234,961	303,532	542,006
Number of Hatchery Fish	-	-	15,707	922,066	4,919,107	5,856,880

*Parts of Jefferson and George Washington National Forests are both in Region 4 and 5. Each region provides assistance to those areas of the forests within their boundaries.

Table 8.-- Summary of Fishery Services on National Parks, 1969

	R E G I O N					Total
	1	2	3	4	5	
Areas visited	3	2	2	5	-	12
Reports submitted	-	5	-	5	-	10
Waters under Management Acres of Lakes & Ponds	34,612	100,976	-	187	-	135,775
Miles of Streams	1,264	614	-	961	-	2,839
Acres of Fish Habitat Reclaimed or Improved	-	-	-	-	-	-
Miles of Stream Reclaimed or Improved	-	16	-	-	-	16
Acres of New Waters Developed	-	-	-	-	-	-
Man-Days of Fishing	282,790	374,000	-	254,992	-	911,782
Pounds of Hatchery Fish	37,464	-	-	23,222	-	60,686
Number of Hatchery Fish	704,780	-	-	102,160	-	806,940

Table 9. -- Summary of Fishery Services on National Wildlife Refugees, 1969

	R E G I O N					
	1	2	3	4	5	Total
Areas visited	2	18	15	17	5	57
Reports submitted	1	7	10	14	2	34
Waters under Management Acres of Lakes & Ponds	5,335	11,187	51,845	174,538	1,839	244,744
Miles of Streams	10	51	10	1,614	9	1,694
Acres of Fish Habitat Reclaimed or Improved	370	1,212	1	-	-	1,583
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	348	-	-	348
Man-Days of Fishing	38,700	556,800	400,643	417,365	7,189	1,420,697
Pounds of Hatchery Fish	7,836	7,926	694	8,691	921	26,068
Number of Hatchery Fish	59,991	147,456	746,720	1,279,382	3,300	2,236,849

Table 10.-- Summary of Fishery Services on Veterans Administration Areas, 1969

	R E G I O N						Total
	1	2	3	4	5		
Areas visited	-	2	6	1	1	10	10
Reports submitted	-	1	1	2	-	4	4
Waters under Management Acres of Lakes & Ponds	-	13	93	13	47	166	166
Miles of Streams	-	-	-	-	-	-	-
Acres of Fish Habitat Reclaimed or Improved	-	3	1	-	-	4	4
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-	-
Man-Days of Fishing	-	2,900	18,360	10,110	6,145	37,515	37,515
Pounds of Hatchery Fish	-	3,458	1,355	1,005	1,970	7,788	7,788
Number of Hatchery Fish	-	2,835	3,492	12,500	8,050	26,877	26,877

Table 11.-- Summary of Fishery Services on Miscellaneous Federal Areas, 1969

	R E G I O N					
	1	2	3	4	5	Total
Areas visited	1	3	4	4	7	19
Reports submitted	-	3	3	4	2	12
Waters under Management Acres of Lakes & Ponds	100	46	381	34	10,007	10,568
Miles of Streams	-	-	5	1	33	39
Acres of Fish Habitat Reclaimed or Improved	-	-	-	-	-	-
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-
Man-Days of Fishing	1,000	5,422	8,507	8,192	250,815	273,936
Pounds of Hatchery Fish	500	3,537	104	20	18,198	22,359
Number of Hatchery Fish	10,640	15,700	408	2,000	494,408	523,156

Table 12. -- Summary of Fishery Services on Indian Reservations, 1969

	R E G I O N					Total
	1	2	3	4	5	
Areas visited	22	26	10	3	1	62
Reports submitted	9	20	8	4	-	41
Waters under Management Acres of Lakes & Ponds	155,506	17,988	17,005	67	3,647	194,213
Miles of Streams	2,373	1,832	22	59	-	4,286
Acres of Fish Habitat Reclaimed or Improved	506	600	158	-	-	1,264
Miles of Stream Reclaimed or Improved	-	10	32	-	-	42
Acres of New Waters Developed	665	141	96	9	-	911
Man-Days of Fishing	573,959	804,354	64,925	52,953	14,000	1,510,191
Pounds of Hatchery Fish	262,803	409,168	14,624	91,992	9	778,596
Number of Hatchery Fish	3,573,090	2,872,067	912,052	234,011	650,000	8,241,220

Table 13. -- Summary of Fishery Services on State-Federal Cooperative Areas, 1969

	R E G I O N					
	1	2	3	4	5	Total
Areas visited	-	8	2	4	22	36
Reports submitted	-	7	1	2	3	13
Waters under Management Acres of Lakes & Ponds	-	172,900	36	48,910	-	221,846
Miles of Streams	-	91	-	21	-	112
Acres of Fish Habitat Reclaimed or Improved	-	-	1	-	-	1
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	36	-	-	36
Man-Days of Fishing	*	999,300	50,050	217,608	**	1,266,958
Pounds of Hatchery Fish	670,744	231,189	35,900	92,375	404,718	1,434,926
Number of Hatchery Fish	12,811,741	5,986,313	29,663	1,080,061	1,381,580	21,289,358

* Not claimed - no field activities.

** Not claimed because of type field activity.

Table 14.-- Summary of Fishery Services on Other Public Areas, 1969

	R E G I O N					
	1	2	3	4	5	Total
Areas visited	-	2	1	1	1	5
Reports submitted	-	-	-	1	1	2
Waters under Management						
Acres of Lakes & Ponds	-	-	275	83,840	146	84,261
Miles of Streams	-	-	-	-	-	-
Acres of Fish Habitat Reclaimed or Improved	-	-	-	-	-	-
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	-	-	-	-
Man-Days of Fishing	-	-	2,750	*	4,000	6,750
Pounds of Hatchery Fish	-	-	-	2,575	5,148	7,723
Number of Hatchery Fish	-	-	-	224,000	15,820	239,820

* Choctawhatchee Bay, Florida, not claimed.

Table 15.-- Summary of Fishery Services on Private Areas, 1969

	R E G I O N					Total
	1	2	3	4	5	
Areas visited	-	10	56	91	56	213
Reports submitted	-	4	2	85	5	96
Waters under Management Acres of Lakes & Ponds	1	23	257	2,352	319	2,952
Miles of Streams	-	-	-	11	10	21
Acres of Fish Habitat Reclaimed or Improved	-	-	8	-	16	24
Miles of Stream Reclaimed or Improved	-	-	-	-	-	-
Acres of New Waters Developed	-	-	111	-	73	184
Man-Days of Fishing	1,600	12,445	4,650	23,515	9,739	51,949
Pounds of Hatchery Fish	443	6,996	722	1,851	1,316	11,328
Number of Hatchery Fish	1,500	21,167	25,175	462,375	53,050	563,267

